

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS / SUMMARY

Title V, Operating
Permit: V-20-027
Inez Compressor Station
KY State Route 3
Inez, KY 41224
October 27, 2020

Brian Harley, Reviewer

SOURCE ID:	21-159-00022
AGENCY INTEREST:	44066
ACTIVITY:	APE20200001

Table of Contents

SECTION 1 – SOURCE DESCRIPTION	2
SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM.....	3
SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS	3
SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS	9
SECTION 5 – PERMITTING HISTORY	10
SECTION 6 – PERMIT APPLICATION HISTORY.....	11
APPENDIX A – ABBREVIATIONS AND ACRONYMS	12

SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 4922, Natural Gas Transmission

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☐ Yes ☒ No If Yes, See Section 4, Table A

28 Source Category ☐ Yes ☒ No If Yes, Category:

County: Martin

Nonattainment Area ☒ N/A ☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ Ozone ☐ Lead

If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☒ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No

If yes, for what pollutant(s)?

☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☐ Yes ☒ No

If yes, list which pollutant(s):

PTE* greater than 25 tpy for combined HAP ☐ Yes ☒ No

*PTE does not include self-imposed emission limitations.

Description of Facility:

Columbia Gas Transmissions, LLC owns and operates the Inez Compressor Station located near Inez, Kentucky in Martin County. The station receives natural gas via pipeline from upstream sources, compresses it using reciprocating internal combustion engines, and then transmits it via pipeline to downstream compressor stations. In addition, a glycol dehydration process is used to remove water from the natural gas.

Significant emission units at the facility consist of one (1) 880 horsepower (hp) natural gas-fired reciprocating engine (E01) and one (1) 30 hp natural gas-fired reciprocating engine (AC1). Natural gas is dehydrated using triethylene glycol (TEG) absorbent, and emissions are controlled by a flare (FLLP1). Absorbed water is driven off from TEG in a regenerator using a natural gas-fired reboiler (BLR1).

Auxiliary equipment includes numerous tanks for the storage of lube oil, used oil, and glycol mixtures.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-20-027

Activities: APE20200001

Received: April 8, 2020

Application Complete Date: October 27, 2020

Permit Action: ☐ Initial ☒ Renewal ☐ Significant Rev ☐ Minor Rev ☐ Administrative

Construction/Modification Requested? ☐ Yes ☒ No NSR Applicable? ☐ Yes ☒ No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☐ Yes ☒ No

Description of Action:

- On April 8, 2020, the Division for Air Quality (Division) received an application for renewal of the Title V operating permit for the Inez Compressor Station in Martin County Kentucky. There have been no changes in significant or insignificant emissions units at the facility, or any new applicable air regulations promulgated since the issuance of the last renewal of the operating permit.

V-20-027 Emission Summary		
Pollutant	2018 Actual (tpy)*	V-20-027 Renewal PTE (tpy)
CO	2.136	19.90
NO _x	28.819	111.22
PT	0.476	1.72
PM ₁₀	0.476	1.72
PM _{2.5}	0.476	1.72
SO ₂	0.007	0.03
VOC	1.191	9.61**
Lead	0.00005	0.00018
Greenhouse Gases (GHGs)		
Carbon Dioxide	1,161.54	5,027.27
Methane	0.021	11.83
Nitrous Oxide	0.021	0.009
CO ₂ Equivalent (CO ₂ e)	1,168.32	5,325.87
Hazardous Air Pollutants (HAPs)		
Benzene	0.017	0.137**
Formaldehyde	0.548	1.901
Toluene	0.009	0.153**
Combined HAPs:	0.743	3.011

* Actual emission are from the 2018 Kentucky Emissions Inventory Survey.

** Emissions from the TEG Dehydration Unit are controlled by a flare.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Units E01 2 Stroke Lean Burn (2SLB) Reciprocating Compressor Engine, AC1 4 Stroke Rich Burn (4SRB) Reciprocating Air Compressor Engine

Initial Construction Date: E01 – 1966; AC1 – 1992

Process Description:

E01 (E01) 2 Stroke Lean Burn (2SLB) Reciprocating Compressor Engine

Model: Cooper-Bessemer GMWA-8TF
Primary Fuel: Natural Gas
Power Output: 880 hp
Max Operating Rate: 0.0076mmscf/hr
Controls: None

AC1 (AC1) 4 Stroke Rich Burn (4SRB) Reciprocating Air Compressor Engine

Model: Wisconsin VG4D1
Primary Fuel: Natural Gas
Power Output: 30 hp
Max Operating Rate: 0.0003mmscf/hr
Controls: None

Applicable Regulation:

401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines applies to stationary RICE located at major and area sources of HAP. Pursuant to 40 CFR 63.6590(a)(1)(iii), a stationary RICE located at an area source of HAP emissions that commences construction before June 12, 2006 is considered an existing stationary RICE for the purposes of 40 CFR 63, Subpart ZZZZ. Therefore 40 CFR 63, Subpart ZZZZ is applicable to both E01 and AC1.

Comments:

Upon further discussion with Columbia Gas Transmissions, LLC, table 3.2-1 from AP-42 Chapter 3 has been used for the emissions factors for NO_x and CO in place of stack test emission factors used previously. The stack test was not witnessed by the Division and records could not be found from the test.

Pursuant to 40 CFR 63.6603(a) and Item 6 in Table 2d to 40 CFR 63, Subpart ZZZZ, the permittee of an existing non-emergency, non-black start 2SLB stationary RICE (emission unit E01) located at an area source of HAP emissions, must comply with the following:

- (i) Change oil and filter every 4,320 hours of operation or annually, whichever comes first;
- (ii) Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first, and replace as necessary; and
- (iii) Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary.

Pursuant to 40 CFR 63.6603(a) and Item 10 in Table 2d to 40 CFR 63, Subpart ZZZZ, the permittee of an existing non-emergency, non-black start 4SRB stationary RICE ≤500 HP (emission unit AC1) located at an area source of HAP emissions, must comply with the following:

- (i) Change oil and filter every 1,440 hours of operation or annually, whichever comes first;
- (ii) Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and

**Emission Units E01 2 Stroke Lean Burn (2SLB) Reciprocating Compressor Engine,
AC1 4 Stroke Rich Burn (4SRB) Reciprocating Air Compressor Engine**

- (iii) Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.

401 KAR 60:005, Section 2(2)(nnn), 40 C.F.R. 60.630 to 60.636 (Subpart KKK), Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011 applies to affected facilities in onshore natural gas processing plants. Pursuant to 40 CFR 60.630(e), a compressor station is covered by 40 CFR 60, Subpart KKK if it is located at an onshore natural gas processing plant. The engines at the facility are at a compressor station, however the facility is not at an onshore natural gas processing plant. Therefore, 40 CFR 60, Subpart KKK is not applicable.

401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 to 60.4248, Tables 1 to 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines applies to stationary RICE that are modified or reconstructed after June 12, 2006. The 880 hp engine was constructed in 1966 and the 30 hp engine was constructed in 1992, so 40 CFR 60, Subpart JJJJ is not applicable.

401 KAR 60:005, Section 2(2)(hhhh), 40 C.F.R. 60.5360 to 60.5430, Tables 1 to 3 (Subpart OOOO), Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015 establishes emission standards and compliance schedules for the control of VOC and SO₂ emissions from affected facilities in the crude oil and natural gas production source category. Pursuant to 40 CFR 60.5365(c), each reciprocating compressor affected facility, which is a single reciprocating compressor is an affected facility under 40 CFR 60, Subpart OOOO. However, the requirements of 40 CFR 60, Subpart OOOO do not apply to the reciprocating compressors at the facility because the compressors were installed in 1966 and 1992, which is before the construction, modification, or reconstruction date of August 23, 2011 required by 40 CFR 60, Subpart OOOO.

Emission Unit DHY1 TEG Dehydration Unit, Reboiler, and Flare

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
Opacity (FLLP1)	≤ 20% opacity for more than 3 min in any 1 day.	401 KAR 63:015, Section 3	N/A	Monthly qualitative visual observations of the flare. If emissions are observed, Method 9, or immediate corrective action resulting in no visible emissions

Initial Construction Date: TEGDHY1: 1/1993; FLLP1: 4/1/1999

Process Description:

DHY1 Dehydration Unit, Reboiler, and Flare

(TEGDHY1) Natural Gas Triethylene Glycol (TEG) Dehydrator

Maximum Operating Rate: 10 mmscf/day (283.17 thousand cubic meters/day)

Control Device: Flare (FLLP1), 95% Control Efficiency

Emission Unit DHY1 TEG Dehydration Unit, Reboiler, and Flare

(BLR1) Reboiler

Primary Fuel: Natural Gas
Reboiler Capacity: 0.75 mmBtu/hr
Control Device: None

(FLLP1) Flare

Flare Capacity: 1.0 mmBtu/hr

Applicable Regulation:

401 KAR 63:002, Section 2(4)(x), 40 C.F.R. 63.760 to 63.777, Appendix (Subpart HH), National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities applies to a permittee of the emission points, specified in 40 CFR 63.760(b) that are located at oil and natural gas production facilities that meet the specified criteria in 40 CFR 63.760(a)(1) and either 40 CFR 63.760(a)(2) or (a)(3). Pursuant to 40 CFR 63.760(a)(1) and (a)(3) a facility shall be a major or area source of hazardous air pollutants as defined in 40 CFR 63.761; and shall process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user. Furthermore, pursuant to 40 CFR 63.760(b)(2), for area sources, the affected source includes each triethylene glycol (TEG) dehydration unit located at a facility that meets the criteria specified in 40 CFR 63.760(a). The Inez Compressor Station is an area source of HAP and processes natural gas before being delivered to the final end user. Therefore, the TEG Dehydrator (TEGDHY1) at the facility is subject to the requirements of 40 CFR 63, Subpart HH.

401 KAR 63:015, Flares applies to each flare, meaning a device at the tip of a stack or other opening used for the disposal of waste gas streams by combustion commenced after April 9, 1972. The flare at the facility (FLLP1) was installed in 1999 and is used for control of waste gas streams from the TEG Dehydrator (TEGDHY1). Therefore the requirements of 401 KAR 63:015 are applicable.

State-Origin Requirements:

401 KAR 63:020, Potentially hazardous matter or toxic substances, applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances, provided that such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division. The reboiler (BLR1) at the facility is not elsewhere subject to the provisions of the administrative regulations of the Division, therefore the requirements of 401 KAR 63:020 apply to the HAP emissions from the reboiler.

Comments:

Pursuant to 40 CFR 63.764(e)(1), the permittee of an area source is exempt from the requirements of 40 CFR 63.764(d) if one of the criteria listed below are met:

- (i) Pursuant to 40 CFR 764(e)(1)(i), the actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters per day, as determined by the procedures specified in 40 CFR 63.772(b)(1); or
- (ii) Pursuant to 40 CFR 764(e)(1)(ii), the actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram per year (1.0 tpy), as determined by the procedures specified in 40 CFR 63.772(b)(2).

Pursuant to 40 CFR 63.774(d)(1), the permittee of a glycol dehydration unit that meets the exemption criteria in 40 CFR 63.764(e)(1)(i) or (ii) shall maintain the records specified in 40 CFR 63.774(d)(1)(i) or d(1)(ii), as appropriate for that glycol dehydration unit as follows:

Emission Unit DHY1 TEG Dehydration Unit, Reboiler, and Flare

- (i) The actual annual average natural gas throughput (in terms of natural gas flowrate to the glycol dehydration unit per day) as determined in accordance with 40 CFR 63.772(b)(1), or
- (ii) The actual average benzene emissions (in terms of benzene emissions per year) as determined in accordance with 40 CFR 63.772(b)(2).
 - (1) Pursuant to 40 CFR 63.772(b)(2)(i), the permittee shall determine actual average benzene or BTEX emissions using the model GRI-GLYCalc™, Version 3.0 or higher, and the procedures presented in the associated GRI-GLYCalc™ Technical Reference Manual. Inputs to the model shall be representative of actual operating conditions of the glycol dehydration unit and may be determined using the procedures documented in the Gas Research Institute (GRI) report entitled “Atmospheric Rich/Lean Method for Determining Glycol Dehydrator Emissions” (GRI-95/0368.1).

Uncontrolled benzene emissions from the glycol dehydration unit process vent at the facility would be 1.25 Mg/year without the flare (FLLLP1). However, with the flare, benzene emissions are 0.06 Mg/year. Therefore, the flare is necessary to comply with exemption listed in 40 CFR 63.764(e)(1)(ii).

Based on the rates of emissions of airborne toxics provided in the application submitted by the source, the source is in compliance with 401 KAR 63:020 for HAP emissions from the reboiler. An updated GRI-GLYCalc™ report was run by the facility on March 17, 2020 and was submitted with the renewal application.

401 KAR 63:002, Section 2(4)(tt), 40 C.F.R. 63.1270 to 63.1287, Tables 1 and 2 (Subpart HHH), National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities applies to facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution company), and that are major sources of HAP. The facility is an area source of HAP so 40 CFR 63, Subpart HHH is not applicable.

401 KAR 59:015, New indirect heat exchangers, applies to indirect heat exchangers having a heat input capacity greater than one (1) mmBtu/hr built after April 9, 1972 for an affected facility with a capacity of 250 mmBtu/hr heat input or less. The reboiler associated with the TEG dehydration unit at the facility has a heat input of 0.75 mmBtu/hr. Therefore 401 KAR 59:015 is not applicable.

401 KAR 60:005, Section 2(2)(nnn), 40 C.F.R. 60.630 to 60.636 (Subpart KKK), Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011 applies to affected facilities in onshore natural gas processing plants. Pursuant to 40 CFR 60.630(e), a dehydration unit, is covered by 40 CFR 60, Subpart KKK if it is located at an onshore natural gas processing plant. The TEG dehydration unit at the facility is not at an onshore natural gas processing plant. Therefore, 40 CFR 60, Subpart KKK is not applicable.

401 KAR 63:020, Potentially hazardous matter or toxic substances, does not apply to the TEG dehydration unit at the facility because it is subject to 40 CFR 63, Subpart HH.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results

N/A

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

N/A

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines	E01, AC1
401 KAR 63:002, Section 2(4)(x), 40 C.F.R. 63.760 to 63.777, Appendix (Subpart HH), National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities (for TEGDHY1)	DHY1
401 KAR 63:015, Flares (for FLLP1)	
401 KAR 63:020, Potentially hazardous matter or toxic substances (for BLR1)	

Table C - Summary of Precluded Regulations:

N/A

Table D - Summary of Non Applicable Regulations:

N/A

Air Toxic Analysis

N/A

Single Source Determination

N/A

SECTION 5 – PERMITTING HISTORY

Permit	Permit type	Activity#	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
G-04-001	General Permit			5/27/2005	General Permit	N/A
G-04-001 R1	General Permit Revision	APE20040001	6/26/2006	1/23/2007	Revisions to Madisonville Location for NOx	N/A
G-09-002	Renewal	APE20090001	2/11/2010	10/4/2020	Renewal Permit	N/A
V-15-015	Renewal	APE20140001	3/23/2015	10/16/2015	Renewal Permit	N/A

SECTION 6 – PERMIT APPLICATION HISTORY

None

APPENDIX A – ABBREVIATIONS AND ACRONYMS

BTEX	– Benzene, Toluene, Ethylbenzene and Xylene
CO	– Carbon Monoxide
Division	– Kentucky Division for Air Quality
GHG	– Greenhouse Gas
HAP	– Hazardous Air Pollutant
hp	– Horsepower
Mg	– Megagram
mmBtu	– Million British thermal units
mmscf	– Million Standard Cubic Feet
NESHAP	– National Emission Standards for Hazardous Air Pollutants
NO _x	– Nitrogen Oxides
NSR	– New Source Review
PM	– Particulate Matter
PM ₁₀	– Particulate Matter equal to or smaller than 10 micrometers
PM _{2.5}	– Particulate Matter equal to or smaller than 2.5 micrometers
PSD	– Prevention of Significant Deterioration
PTE	– Potential to Emit
RICE	– Reciprocating Internal Combustion Engines
SO ₂	– Sulfur Dioxide
TEG	– Triethylene Glycol
VOC	– Volatile Organic Compounds